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Article

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Two new genera and one new assignment of eriophyoid mites (Acari: Eriophyoidea) from Thailand

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Abstract

Three eriophyoid mites (two new genera and three new combinations) from Thailand are redescribed herein. They are: *Phutsona* **gen. nov.**, *Ph. ervatamiae* (Chandrapatya, 1991) **comb. nov.** on *Gardenia jasminoides* J. Ellis (Rubiaceae) [the original host plant, *Ervatamia coronaria*, was an error in identification]; *Lipacarus* **gen. nov.**, *L. eugeniae* (Boczek, 1992) **comb. nov.** on *Syzygium samarangense* (Blume) Merr. and L.M. Perry (Myrtaceae); *Pentacecidophyes litchi* (Boczek, 1996) **comb. nov.** on *Litchi chinensis* Sonn. (Sapindaceae). *Pentacecidophyes* is reassigned to Eriophyidae, Phyllocoptinae, Phyllocoptini. *Pentacecidophyes xinglongis* Xue, Cheng and Hong, 2011 is considered as a junior synonym of *Pe. litchi*.

Key words: Eriophyidae; Diptilomiopidae; *Phutsona* **gen. nov.**; *Lipacarus* **gen. nov.**; *Pentacecidophyes*; α-taxonomy.

Introduction

Thailand is located in a tropical region where plants are very diverse. Hence, many eriophyoid mites have been reported from this country. To date, there are 240 species of eriophyoid mites known from Thailand (Xue and Zhang 2009). However, only two mites of the families Eriophyidae and Diptilomiopidae have been found in Thailand (Amrine and Stasny 1994; de Lillo and Amrine 1998; Amrine *et al*. 2003; Xue and Zhang 2009).

Most species of eriophyoid mites in Thailand were identified by Chandrapatya and Boczek in a series of papers published in the late 1980s to early 2000s. Recently, many species of Thai eriophyoid mites were reviewed according to the World Generic Key of Eriophyoid Mites provided by Amrine *et al*. (2003). More critical analysis of the material in the eriophyoid mite collections of A. Chandrapatya at Kasetsart University, Bangkok, Thailand, revealed two new genera and three new combinations, as presented below.

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Materials and Methods

All mite specimens in this study were collected by the first author. Each mite was cleared in Keifer's I solution before mounting on microscope slides using Keifer's III solution as the mounting medium (Keifer 1954). Glyptal (Glyptal 1201, red enamel insulating paint, Glyptal Inc., 305 Eastern Ave., Chelsea, MA 02150, USA) was used to seal all microscope slides and specimens were re-examined under a phase contrast microscope (Olympus BX 43) where several parts of the body were redrawn, if necessary, using the drawing tube attached to the microscope.

The morphological nomenclature follows that of Lindquist (1996) and systematic classification follows that of Amrine *et al*. (2003). All measurements, unless specified otherwise, refer to lengths expressed in micrometers (µm). Measurements were made according to Amrine and Manson (1996) and de Lillo *et al.* (2010). However, all holotypes in this set of mites were lost in lending back and forth to Poland. Therefore, neotypes were selected for all three mites described here where all paratypes were re-measured. For females, measurement of the neotype precedes the corresponding range for the paratypes. Measurements of male mites are also provided for each species.

Paratypes were deposited in the collection of Department of Entomology, Kasetsart University, Bangkok, Thailand. Some paratypes were also deposited in the collection of the Mite and Spider Research Group, Entomology and Zoology Group, Plant Protection Research and Development Office, Department of Agriculture, Ministry of Agriculture and Co-operatives, Bangkok, Thailand.

Systematics

Family Diptilomiopidae Keifer, 1944
Subfamily Diptilomiopinae Keifer, 1944

Phutsona gen. nov.

Type species: *Vilaia ervatamiae* Chandrapatya, 1991.

Diagnosis

Female – Body fusiform; gnathosoma large; chelicerae abruptly curved and bent down near base, pedipalp coxal seta *ep* and pedipalp genual setae *d* not observed. Prodorsal shield without frontal lobe. Scapular setae *sc* absent; scapular tubercles situated ahead of rear shield margin. Legs with five segments, genu fused with femur, lacking setae on both femur and tibia and paraxial fastigial tarsal setae *ft′* of leg II; empodium divided. Coxisterna I touching basally, lacking proximal setae *1a*, tubercles for proximal setae *1a* present. Dorsal opisthosomal annuli smooth, with three longitudinal ridges, opisthosomal setae *c2* absent.

Remarks

This new genus *Phutsona* is close to *Diptilomiopus* Nalepa, 1916 and *Neodiptilomiopus* Mohanasundaram, 1982 but can be differentiated by the presence on the genu, of paraxial fastigial tarsal setae *ft′* on leg II and by the unique arrangement of setae on coxisterna I. Both *Phutsona* and *Diptilomiopus* lack genu on both legs while genu is lacking from only leg II of *Neodiptilomiopus*. Leg II of *Phutsona* and *Diptilomiopus* lacking paraxial fastigial tarsal setae *ft′* which is present in

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Neodiptilomiopus. Coxisterna I of *Diptilomiopus* lacking anterior setae *1b*, this seta is present in *Phutsona*. However, the proximal setae on coxisterna I, *1a* are missing in *Phutsona*, only their tubercles are present. Coxisterna I and II of *Neodiptilomiopus* has only proximal setae *2a* on coxisterna II; setae *1a* and *1b* are absent.

Etymology

The generic name is after the Thai local name of the host plant, Phut son (Phut son + -a) (Gender: feminine).

Phutsona ervatamiae (Chandrapatya, 1991) comb. nov. (Fig. 1)

Vilaia ervatamiae Chandrapatya, 1991; Chandrapatya and Boczek, 1991: 39(4): 430–431, f. 3.
Vilaia ervatamiae Chandrapatya, 1991; Amrine and Stasny, 1994: 312, #2877.
Diptilomiopus ervatamiae (Chandrapatya, 1991); Hong and Zhang, 1997: 22: 322.
Vilaia ervatamiae Chandrapatya, 1991; Chandrapatya and Boczek, 2002: 138.
Diptilomiopus ervatamiae (Chandrapatya, 1991); Xue and Zhang, 2009: 93.

Redescription

Female (n = 10) – Body fusiform, 135 (135–152), 80 (76–80) wide; 71 thick; amber. Gnathosoma 41 (37–44) large; pedipalp coxal seta *ep* absent, pedipalp genual seta *d* not observed, subapical pedipalp tarsal seta *v* 3 (3–5), chelicerae 45 (45–46), abruptly curved and bent down near base. Prodorsal shield 42 (35–49), 80 (57–92) wide, suboval, without prodorsal shield frontal lobe. Scapular setae *sc* absent, scapular tubercles 24 (23–24) apart, situated 7 (7–8) ahead of rear shield margin. Shield design with a netlike pattern of 12 cells. Leg I 31 (31–38); femur 15 (13–16), basiventral femoral seta *bv* absent; genu absent; tibia 7 (5–7), paraxial tibial seta *l′* absent; tarsus 9 (7–9), antaxial fastigial tarsal seta *ft″* 31 (30–33), paraxial fastigial tarsal seta *ft′* 30 (30–32), paraxial unguinal tarsal seta *u′* 6 (5–6), solenidion *ω* almost straight, knobbed, 6 (range not available); empodium 8 (6–8), divided, 5 (5–6)- rayed. Leg II 27 (25–27); femur 12 (10–13), basiventral femoral seta *bv* absent; genu absent; tibia 5 (4–6); tarsus 6 (6–8), antaxial fastigial tarsal seta *ft″* 26 (25–27), paraxial fastigial tarsal seta *ft′* absent, paraxial unguinal tarsal seta *u′* 5 (5–7), solenidion *ω* almost straight, knobbed, 6 (6–7); empodium 8 (7–8), divided, 5 (5–6)-rayed. Coxisternal plates: both coxisterna smooth. Coxisterna I touching basally, 5 (range not available). Anterior setae on coxisterna I *1b* 10 (7–10), 9 (9–11) apart; proximal setae on coxisterna I *1a* absent, tubercles 8 (8–9) apart; proximal setae on coxisterna II *2a* 48 (39–48), 26 (25–29) apart; coxigenital annuli 7 (6–10), microtuberculated. Opisthosoma with 53 (53–60) smooth dorsal annuli, last 5 annuli with minute microtubercles, situated on rear margin of annuli. Ventral opisthosoma with 73 (72–80) annuli, with slightly elongate microtubercles situated on rear margin of annuli. Microtubercles elongated on the last 6 (6–10) ventral annuli. Dorsal opisthosoma with three longitudinal ridges. Middorsal longitudinal ridge extending from shield to annuli 42 (41–44); subdorsal longitudinal ridge extending from shield to annuli 42 (39–45). Opisthosomal setae *c2* absent; opisthosomal setae *d* 13 (8–13), 35 (28–35) apart, on annulus 32 (29–34); opisthosomal setae *e* 8 (7–9), 20 (16–20) apart, on annulus 47 (43–51); opisthosomal setae *f* 28 (27–32), 29 (24–29) apart, on annulus 65 (64–72), or 8th (8th–9th) annulus from the rear. Opisthosomal setae *h1* minute, opisthosomal setae *h2* 52 (40–52). Female genitalia 20

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(20–24), 27 (25–27) wide, coverflap with several broken short lines basally, smooth distally; proximal setae on coxisterna III *3a* 7 (range not available), 15 (14–15) apart.

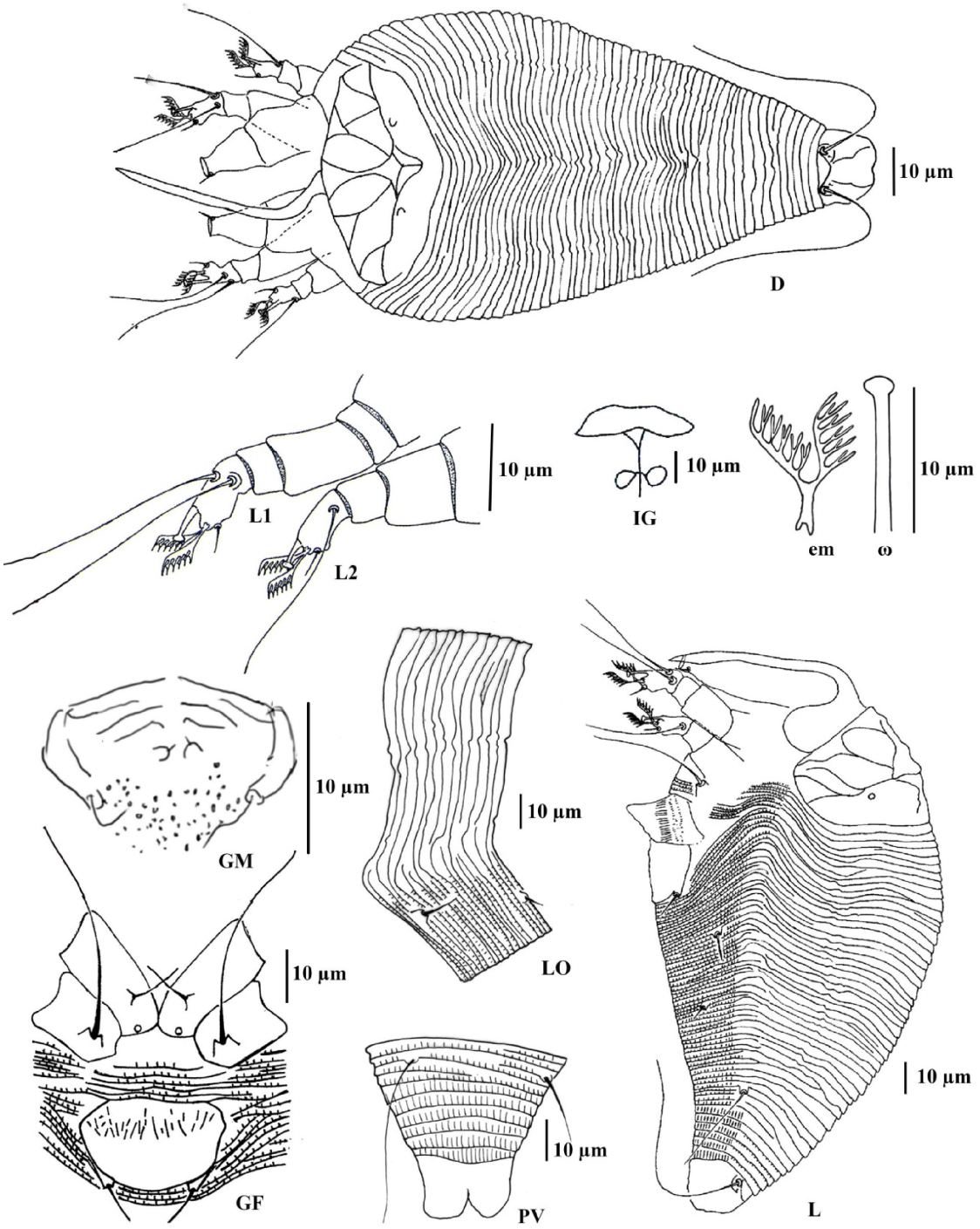

Figure 1. *Phutsona ervatamiae* (Chandrapatya, 1991) **comb. nov.** – D, Dorsal view of female; em, empodium; GF, female genitalia; GM, male genitalia; IG, female internal genitalia; LM, Lateral view of female; LO, lateral opisthosoma; L1, leg I; L2, leg II; PV, postero-ventral opisthosoma; ω, solenidion.

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Male (n =1 specimen from material examined) – 140, 66 wide. Gnathosoma 38 large; pedipalp coxal seta *ep* absent, pedipalp genual seta *d* not observed, subapical pedipalp tarsal seta *v* 4, chelicerae 45, abruptly curved and bent down near base. Prodorsal shield: 25, 59 wide, similar to female. Scapular setae *sc* absent, scapular tubercles 23 apart. Prodorsal shield frontal lobe absent. Leg I 30; femur 13, basiventral femoral seta *bv* absent; genu 3, antaxial genual seta *l″* absent; tibia 7, paraxial tibial seta *l′* absent; tarsus 7, antaxial fastigial tarsal seta *ft″* 26, paraxial fastigial tarsal seta *ft′* 26, paraxial unguinal tarsal seta *u′* 4, solenidion *ω* almost straight, knobbed, 5; empodium 7, divided, 5-6-rayed. Leg II 23; femur 11, basiventral femoral seta *bv* absent; genu absent; tibia 4; tarsus 7, antaxial fastigial tarsal seta *ft″* 21, paraxial fastigial tarsal seta *ft′* absent, paraxial unguinal tarsal seta *u′* 4, solenidion *ω* almost straight, knobbed, 5; empodium 6, divided, 5-6-rayed. Coxisternal plates: both coxisterna smooth. Coxisterna I touching basally, 3. Anterior setae on coxisterna I *1b* 8, 12 apart; proximal setae on coxisternaI *1a* absent; tubercles 10 apart; proximal setae on coxisterna II *2a* 33, 29 apart; coxigenital annuli 6, microtuberculated. Opisthosoma with 49 dorsal annuli, 59 ventral annuli. Opisthosomal setae *c2* absent; opisthosomal setae *d* 8, 25 apart, on annulus 21; opisthosomal setae *e* 17, 14 apart, on annulus 33; opisthosomal setae *f* 21, 21 apart, on annulus 51, or 8th annulus from the rear. Opisthosomal setae *h1* minute, opisthosomal setae *h2* 44. Male genitalia 20 wide, proximal setae on coxisterna III *3a* 4, 16 apart.

Type material

Neotype – Female (slide set #43), Ram Indra, Khet Khan Na Yao, Bangkok, Thailand (13° 50.80698' N, 100° 39.28992' E), 12 February 1988, leaves of *Gardenia jasminoides* J. Ellis (Phut son, Cape jasmine), Rubiaceae; coll. A. Chandrapatya.

Paratypes – 10 females on 10 microscope slides (slide set #43/1-43/10), with the same collecting information as neotype.

Specimens examined – Kamphaeng Saen District, Nakhon Pathom Province (14° 00.64770' N, 99° 58.12848' E), 29 August 1997, 30 females on 30 microscope slides (slide set #527/1-527/30), leaves of *G. jasminoides*; coll. A. Chandrapatya; Kamphaeng Saen District, Nakhon Pathom Province (14° 00.64770' N, 99° 58.12848' E), 14 August 1998; 17 females on 17 microscope slides (slide set #924/1-924/17), leaves of *G. jasminoides*; coll. A. Chandrapatya; Phitsanulok Province (16° 48.28266' N, 100° 18.99504' E), 6 May 2011; 4 females and 1 male on 5 microscope slides (slide set #2892/1-2892/5), leaves of *G.jasminoides*; coll. P. Konvipasruang.

Relation to host – Vagrant on lower leaf surfaces. No apparent damage was observed.

Etymology

The species name was derived from the generic name of the host plant, *Ervatamia*. However, the host plant is actually *G. jasminoides*, not *Ervatamia loronaria* Stapf. It was an error in identification by the collector.

Family Eriophyidae Nalepa, 1898
Subfamily Phyllocoptinae Nalepa, 1892
Tribe Anthocoptini Amrine and Stasny, 1994

***Lipacarus* gen. nov.**

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Type species: *Indotegolophus eugeniae* Boczek, 1992.

Diagnosis

Body elongate, fusiform; gnathosoma moderately large; pedipalp genual seta *d* and subapical pedipalp tarsal seta *v* absent; scapular tubercles set near or on rear shield margin, directing setae posteriorly. Legs lacking setae on femur and tibia of leg I; solenidion of leg I shorter than empodium, broad, located mesal to empodium and recurved, light in color, tip bluntly rounded; solenidion of leg II dorsal to and longer than empodium, more narrow and tapered to a blunt tip. Coxisterna I and II with all usual setae. Opisthosomal annuli microtuberculated on both surfaces, faint and small; dorsal opisthosomal annuli larger than ventral opistosomal annuli, dorsal opisthosoma with three ridges, middorsal ridge fading at about opisthosomal setae *e*, lateral ridges with flat oval disc at dorso-lateral margin bearing 3–7 longitudinal striations; opisthosoma with all normal setae, except opisthosomal setae *h1*.

Remarks

Lipacarus belongs to the Family Eriophyidae, Subfamily Phyllocoptinae, Tribe Anthocoptini. This mite was originally placed into *Indotegolophus* as *I. eugeniae* Boczek, 1992. It lacks the paraxial tibial setae *l′* on leg I. Hence, it represents a new genus that we here designate as *Lipacarus*. The separate species *Liparus eugeniae* Boczek, 1996 was also re-examined and found to have the tibia of both legs equal in size to the genu, and not very small as indicated in the line drawing; *Liparus eugeniae* is identical to the mite described as *I. eugeniae* and is thus its junior synonym. Finally, *Liparus* becomes invalid, as well as its replacement name, *Thaicesa* Kocak and Kemal, 2008.

Lipacarus is close to *Abacarus* Keifer, 1944, *Tegolophus* Keifer, 1961 and *Phaicus* Konvipasruang, Chandrapatya and Amrine, 2012 in having prominent scapular tubercles and setae on rear shield margin, simple empodium and three longitudinal dorsal ridges on opisthosoma. From these genera, *Lipacarus* can be distinguished by the absence of basiventral femoral seta *bv* and paraxial tibial seta *l′* on leg I and the unusual solenidia of leg I.

Etymology

As wished by Jan Boczek, *Lipacarus* is named in honor of J.J. Lipa, who founded the concept of Eriophyoidea as potential biological control agents in Poland. Boczek originally intended to honor J.J. Lipa with the name *Liparus* which is preoccupied by *Liparus* in Lepidoptera, Mollusca, and Coleoptera (Kocak and Kemal 2008) (Gender: masculine).

***Lipacarus eugeniae* (Boczek, 1992) comb. nov. (Fig. 2)**

Indotegolophus eugeniae Boczek, 1992; Boczek and Chandrapatya, 1992: 266–267, f. 5.
Indotegolophus eugeniae Boczek, 1992; Xue and Zhang, 2009: 84.
Liparus eugeniae Boczek, 1996; Boczek and Chandrapatya, 1996: 61–63, f. 1.
Thaicesa eugeniae (Boczek, 1992); Kocak and Kemal, 2008: 2.

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Redescription

Female (n = 9, 2 from slides #81.1 formerly *I. eugeniae* and 7 from slides # 201 formerly *L. eugeniae* which are now the same mites) – Body fusiform, 152 (135–157), 55 (54–59) wide; 53 thick; light yellow. Gnathosoma 22 (19–23) projecting downwards; pedipalp coxal seta *ep* 1 (1–2), pedipalp genual seta *d* absent, subapical pedipalp tarsal seta *v* absent, chelicerae 17 (17–20), almost straight. Prodorsal shield 36 (31–40), 53 (50–57) wide, rounded anteriorly. Scapular setae *sc* 11 (10–13), on scapular tubercles 41 (38–43) apart, situated laterally on rear shield margin, directed divergently to the rear. Shield design consists of admedian lines subparallel to each together in the center and forming two circular cells anteriorly, connected to the cross line at 1/4 from the rear; prodorsal shield frontal lobe rounded, extending over gnathosoma, 3 (2–4). Leg I 21 (19–22); femur 8 (8–9), basiventral femoral seta *bv* absent; genu 3 (2–3), antaxial genual seta *l″* 21 (17–22); tibia 2 (2–3), paraxial tibial seta *l′* absent; tarsus 5 (4–5), antaxial fastigial tarsal seta *ft″* 16 (15–18), paraxial fastigial tarsal seta *ft′* 15 (14–16), paraxial unguinal tarsal seta *u′* 4 (4–5), solenidion *ω* curved, unknobbed, 4 (4–5); empodium 6 (5–6), simple, 5-rayed. Leg II 18 (17–19); femur 8 (7–9), basiventral femoral seta *bv* 17 (17–21); genu 3 (2–3), antaxial genual seta *l″* 9 (8–12); tibia 2 (2–3); tarsus 3 (3–5), antaxial fastigial tarsal seta *ft″* 17 (16–19), paraxial fastigial tarsal seta *ft′* 7 (4–8), paraxial unguinal tarsal seta *u′* 5 (4–6), solenidion *ω* curved, unknobbed, 6 (range not available); empodium 5 (4–5), simple, 5-rayed. Coxisternal plates: both coxisterna with a few short lines. Coxisterna I fused, not forming internal coxisternal apodeme. Anterior setae on coxisterna I *1b* 4 (3–6), 10 (8–10) apart, proximal setae on coxisterna I *1a* 10 (9–14), 12 (11–13) apart; proximal setae on coxisterna II *2a* 14 (14–24), 25 (20–25) apart; coxigenital annuli 3 (2–3), smooth. Opisthosoma with 51 (44–53) annuli, with faint and elongate microtubercles. Ventral opisthosoma with 54 (52–67) annuli, with short microtubercles; both dorsal and ventral annuli situated on rear margin of annuli. Dorsal opisthosoma with three longitudinal ridges; middorsal ridge shorter than subdorsal ridges, fading at about opisthosomal setae *e*, lateral ridges with flat oval disc at dorso-lateral margin bearing 3–7 longitudinal striations. Opisthosomal setae *c2* 19 (17–24), 43 (40–46) apart, on annulus 7 (6–9); opisthosomal setae *d* 40 (34–48), 27 (27–36) apart, on annulus 18 (16–20); opisthosomal setae *e* 29 (25–40), 15 (15–17) apart, on annulus 33 (29–41); opisthosomal setae *f* 16 (14–16), 17 (15–18) apart, on annulus 47 (45–60), or 7th annulus from the rear. Opisthosomal setae *h1* absent, opisthosomal setae *h2* 36 (30–37), on long tubercles. Female genitalia 15 (14–17), 18 (16–21) wide, coverflap with basal punctations and distal concentric curves in two longitudinal ranks; proximal setae on coxisterna III *3a* 7 (6–8), 13 (12–15) apart.

Male (n = 2 specimens from material examined). 124–127, 47 wide, 46 thick. Gnathosoma 19–20; pedipalp coxal seta *ep* 2, pedipalp genual seta *d* absent, subapical pedipalp tarsal seta *v* absent, chelicerae 17–20. Prodorsal shield 33–38, 47 wide, similar to female. Scapular setae *sc* 8–9, on scapular tubercles 32 apart, situated laterally on rear shield margin, directed divergently to the rear. Prodorsal shield frontal lobe 3–4. Leg I 18; femur 7–8, basiventral femoral seta *bv* absent; genu 3, antaxial genual seta *l″* 18–20; tibia 2–3, paraxial tibial seta *l′* absent; tarsus 4–5, antaxial fastigial tarsal seta *ft″* 16, paraxial fastigial tarsal seta *ft′* 14, paraxial unguinal tarsal seta *u′* 4–5, solenidion *ω* curved, unknobbed, 4; empodium 5, simple, 5–rayed. Leg II 16–17; femur 8, basiventral femoral seta *bv* 15; genu 2–3, antaxial genual seta *l″* 10; tibia 2; tarsus 3–4, antaxial fastigial tarsal seta *ft″* 16, paraxial fastigial seta *ft′* 5, paraxial unguinal seta *u′* 4, solenidion *ω* curved, unknobbed, 4–5; empodium 5–6, simple, 5-rayed. Coxisternal

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plates: both coxisterna with a few short lines. Coxisterna I separated, not forming internal coxisternal apodeme. Anterior setae on coxisterna I *1b* 5, 10 apart; proximal setae on coxisterna I *1a* 9-10, 10 apart; proximal setae on coxisterna II *2a* 14, 19 apart; coxigenital annuli 2, smooth. Opisthosoma with 47–48 dorsal annuli, 56–57 ventral annuli. Opisthosomal setae *c2* 24, 36 apart, on annulus 6–9; opisthosomal setae *d* 23, 25

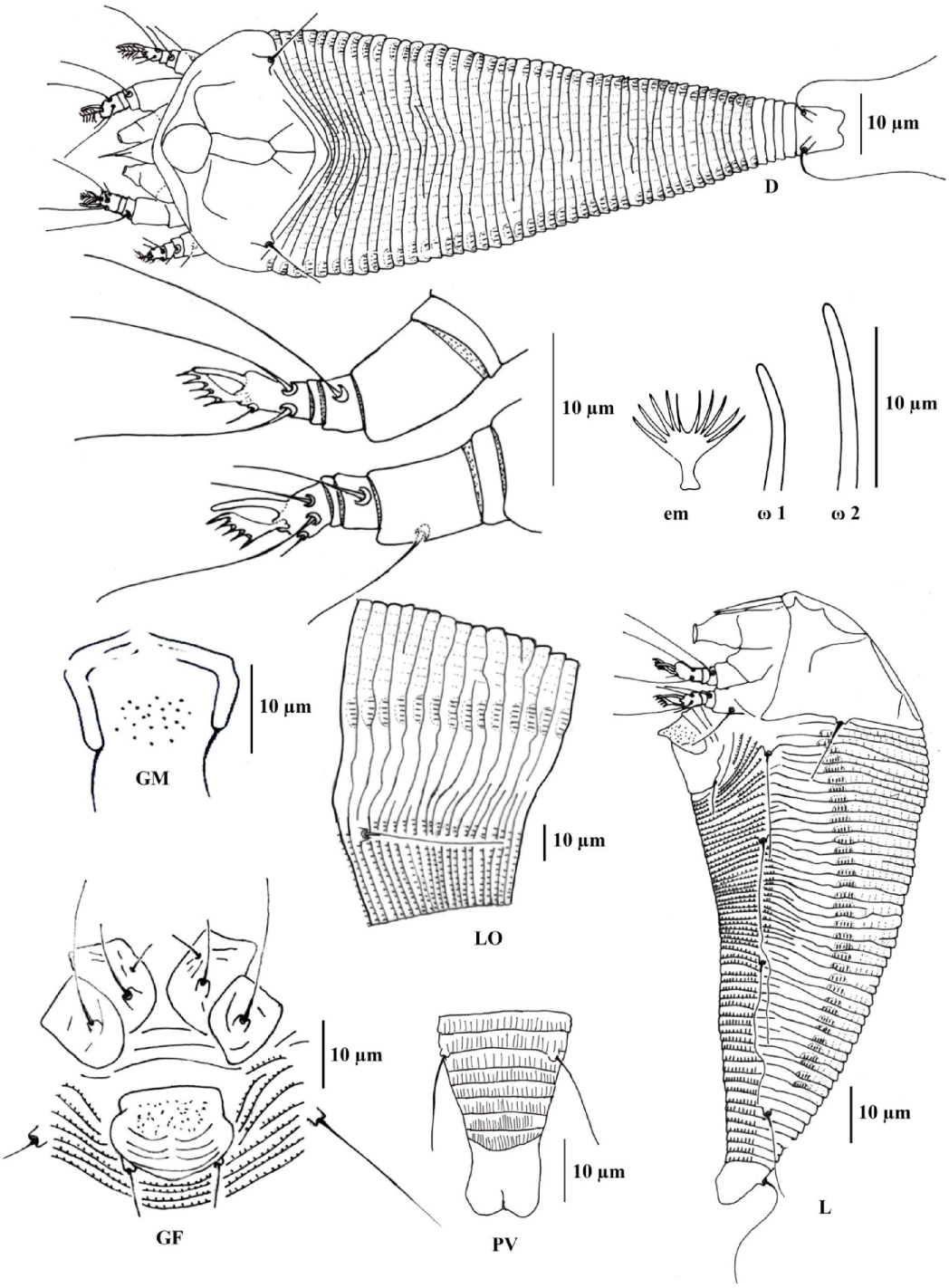

Figure 2. *Lipacarus eugeniae* (Boczek, 1993) **comb. nov.** – D, Doral view of female; em, empodium; GF, female genitalia; GM, male genitalia; LM, Lateral view of female; LO, lateral opisthosoma; L1, leg I; L2, leg II; PV, postero-ventral opisthosoma; ω1, solenidion I, ω2, solenidion II.

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apart, on annulus 15–19; opisthosomal setae *e* 24–25, 14 apart, on annulus 32–34; opisthosomal setae *f* 13–14, 15 apart, on annulus 49–50, or 7th annulus from the rear. Opisthosomal setae *h1* absent, opisthosomal setae *h2* 27–31. Male genitalia 43 wide, proximal setae on coxisterna III *3a* 6–8, 12 apart.

Type material

Neotype – Female (slide set #81.1) Bangkruai District, Nonthaburi Province (13° 48.79164' N, 100° 25.02810' E), 3 ii 1992, leaves of *Syzygium samarangense* (Blume) Merr. and L.M. Perry (Chomphu, Wax apple), Myrtaceae; coll. A. Chandrapatya.

Paratypes – 1 female on 1 microscope slide (slide set #81.1/1), with the same collecting information as neotype.

Specimens examined – Ban Pae Sub-district, Klaeng District, Rayong Province (12° 46.67448' N, 101° 40.03542' E), 6 July 1996, 5 females and 2 males on 7 microscope slides (slide set #201/1-201/7), leaves of *Syzygium* sp. (Chomphu), Myrtaceae; coll. A. Chandrapatya.

Relation to host – Vagrant on the lower leaf surface. No apparent damage was observed.

Etymology

The species name is based on the former name of the host plant generic name, *Eugenia*.

Family Eriophyidae Nalepa, 1898
Subfamily Phyllocoptinae, Nalepa, 1892
Tribe Phyllopcoptini Nalepa, 1892

***Pentacecidophyes* Xue, Cheng and Hong, 2011**

Type species: *Abacarus litchi* Boczek, 1996.
Pentacecidophyes litchii (Boczek, 1996) [originally in *Abacarus*]; *Pentacecidophyes xinglongis* Xue, Cheng and Hong, 2011 (Figs. 3 & 4), is now a junior synonym.

This genus was established by Xue, Cheng and Hong, 2011 with *Pentacecidophyes xinglongis* as type species. *Pentacecidophyes* was originally assigned to the family Eriophyidae, subfamily Cecidophyinae, tribe Colomerini. After careful examination, it was found that assignment to Cecidophyinae, Colomerini was not justified since there is too much space between the coxisterna of leg II and the genital shield which is not appressed to coxa; the longitudinal ridges on the coverflap are not arranged in two ranks and the genital apodeme (not figured by either author) apparently is not foreshortened and bar-like.

Pentacecidophyes is reassigned to the Subfamily Phyllocoptinae, Tribe Phyllocoptini. It is close to *Visinus* Chandrapatya, 1996 but can be differentiated by the appearance of the dorsal opisthosoma which has five longitudinal ridges while the opisthosoma of *Visinus* is evenly rounded.

Pentacecidophyes xinglongis is now considered as a junior synonym of *P. litchi* (Boczek, 1996).

Redefinition

Body fusiform; prodorsal shield with broad frontal lobe, scapular tubercles and

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setae *sc* near rear shield margin, scapular tubercles long, scapular setae *sc* projecting posterior and centrad; anterolateral setae on coxisterna I *1b* absent; legs with paraxial tibial seta *l′* absent; opisthosoma with wide dorsal annuli and narrow ventral annuli, dorsal annuli with five ridges, middorsal, subdorsal and lateral ridges ending simultaneously; opisthosoma with all usual series of setae; empodium entire; opisthosomal setae *h1* present, directed forward; female genitalia placed at a moderate distance posterior to coxae.

Notes

This genus is now assigned to Eriophyidae, Phyllocoptinae, Phyllocoptini. This genus is similar to *Visinus*, which has the opisthosoma evenly rounded.

Pentacecidophyes litchi **(Boczek, 1996) comb. nov. (Fig. 3)**

Abacarus litchi Boczek, 1996; Chandrapatya and Boczek, 1996: 74, 76–77, f. 3.
Abacarus litchi Boczek, 1996; Huang and Cheng, 2005: 288.
Abacarus litchi Boczek, 1996; Xue and Zhang, 2009: 78.
Pentacecidophyes xinlongis Xue, Cheng and Hong, 2011 **syn. nov.**: 37–47.
Pentacecidophyes litchi (Boczek, 1996) **comb. nov.**

Redescription

Female (n = 8) – Body fusiform, 174 (147–186), 57 (57–63) wide; 56–61 thick; transparent. Gnathosoma 29 (19–29) projecting downwards; pedipalp coxal seta *ep* 2 (range not available), dorsal pedipalp genual seta *d* 5 (5–6), subapical pedipalp tarsal setae *v* 2 (range not available), chelicerae 17 (14–22), almost straight. Prodorsal shield 37 (34–40), 57 (54–60) wide, rounded anteriorly, subquadrangular. Scapular setae *sc* 22 (22–27), on finger-like scapular tubercles 25 (24–28) apart, situated 13 (6–13) ahead of rear shield margin, directed posteriorly and diverging. Shield design U-shaped centrally. Lateral line situated 1/5 from anterior shield margin, curving toward the lateral margin of the prodorsal shield, prodorsal shield frontal lobe broad, extending over gnathosoma, 5 (4–5). Leg I 25 (22–25); femur 11 (10–12), basiventral femoral seta *bv* 8 (7–10); genu 4 (3–4), antaxial genual seta *l″* 30 (25–30); tibia 4 (3–4), paraxial tibial seta *l′* absent; tarsus 5, antaxial fastigial tarsal seta *ft″* 22 (18–24), paraxial fastigial tarsal seta *ft′* 21 (16–21), paraxial unguinal tarsal seta *u′* 3 (3–4), solenidion *ω* slightly curved, knobbed, 5 (4–5); empodium 5 (4–5), simple, 6-rayed (the basal ray of the empodium is strong, anteriorly directed with 4 well sclerotized branches directed laterally. When this ray is in focus, the empodium appears divided; focusing on the apex shows a normal Y-shaped apex of a simple empodium). Leg II 22 (21–23); femur 11 (8–11), basiventral femoral seta *bv* 15 (11–16); genu 4 (3–4), antaxial genual seta *l″* 8 (6–8); tibia 3 (2–3); tarsus 5 (3–5), antaxial fastigial tarsal seta *ft″* 21 (15–22), paraxial fastigial tarsal seta *ft′* 4 (4–6), paraxial unguinal tarsal seta *u′* 4 (3–4), solenidion *ω* slightly curved, knobbed, 7 (7–8); empodium 5 (4–5), simple, 6-rayed. Coxisternal plates: coxisterna I with a few granules; coxisterna II with smooth surface. Internal coxisternal apodeme a line, 6 (5–7). Anterior setae on coxisterna I *1b* absent, proximal setae on coxisternaI *1a* 10 (8–10), 11 (10–13) apart; proximal setae on coxisterna II *2a* 27 (21–34), 22 (21–26) apart; coxigenital annuli 3 (3–4), smooth. Opisthosoma with 35 (32–36) annuli, with elongate microtubercles in the middle of the first to 29th (28th-32nd) dorsal annuli. Ventral opisthosoma with 54 (54–63) annuli, with elongate microtubercles; situated on rear

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margin of annuli. Dorsal opisthosoma with five longitudinal ridges; middorsal, subdorsal and lateral longitudinal ridges ending simultaneously. Opisthosomal setae *c2*

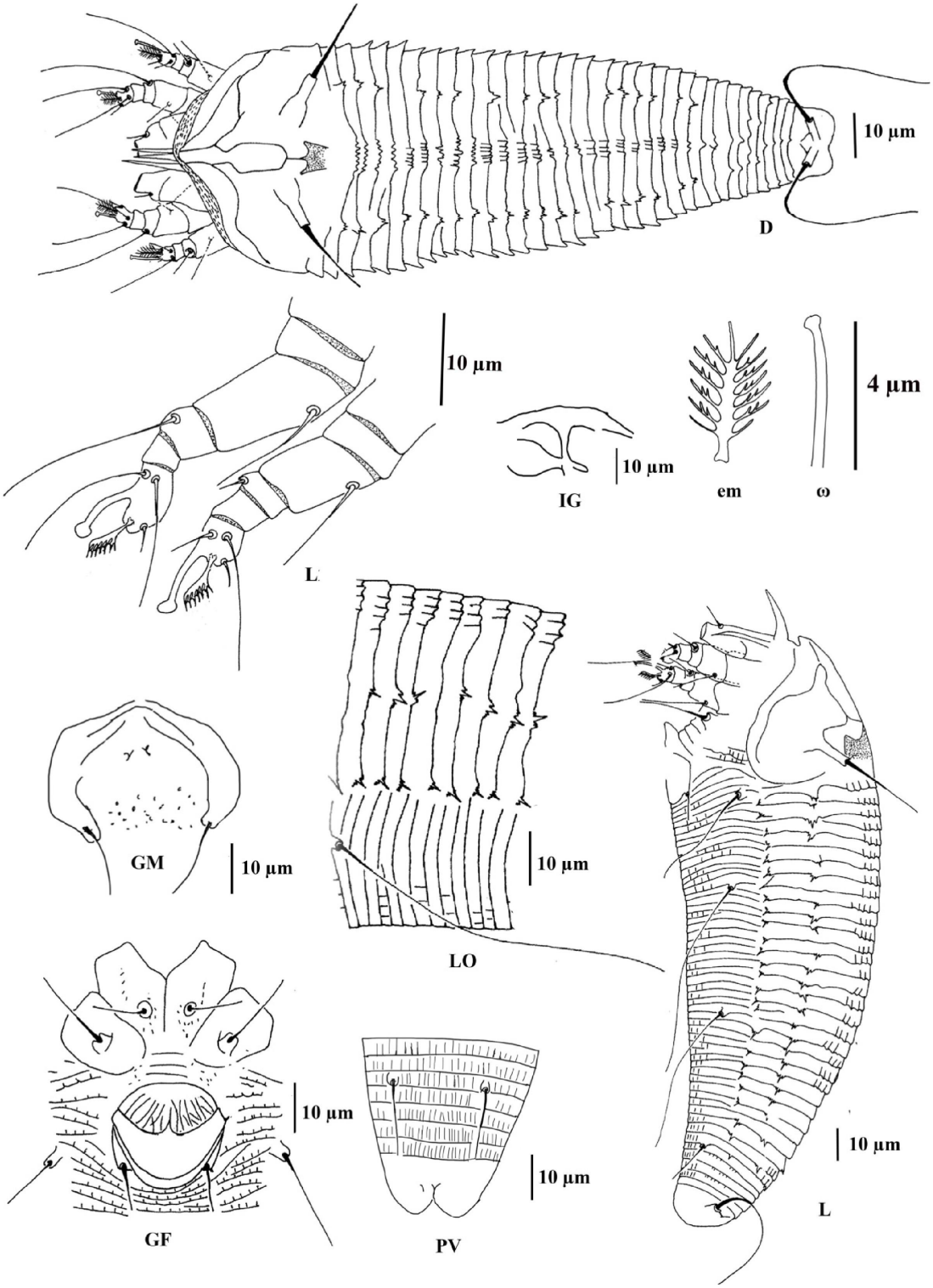

Figure 3. *Pentacecidophyes litchi* (Boczek, 1996) **comb. nov.** – D, Dorsal view of female; em, empodium; GF, female genitalia; GM, male genitalia; IG, female internal genitalia; LM, Lateral view of female; LO, lateral opisthosoma; L1, leg I; L2, leg II; PV, postero-ventral opisthosoma; ω, solenidion.

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47 (28–47), 46 (42–48) apart, on annulus 5 (5–8); opisthosomal setae *d* 58 (48–65), 32 (30–38) apart, on annulus 15 (13–20); opisthosomal setae *e* 47 (31–47), 27 (23–27) apart, on annulus 33 (33-39); opisthosomal setae *f* 12 (12–15), 17 (16–18) apart, on annulus 49 (49–58), or 5th annulus from the rear. Opisthosomal setae *h1* 3 (range not available), opisthosomal setae *h2* 56 (42–60). Female genitalia not appressed to coxae: 16 (13–19), 20 (19–20) wide, coverflap with several longitudinal ridges in a single row; proximal setae on coxisterna III *3a* 10 (8–15), 12 (12–15) apart.

Male (n = 1) – 148, 52 wide. Gnathosoma 21; pedipalp coxal setae *ep* 2, pedipalp genual setae *d* 5, subapical pedipalp tarsal setae *v* 2. Chelicerae 18. Prodorsal shield: 36, 50 wide, similar to female. Scapular setae *sc* 18, on scapular tubercles 21 apart, situated 9 ahead of rear shield margin. Prodorsal shield frontal lobe 4. Leg I 23; femur 9, basiventral femoral setae *bv* 7; genu 3, antaxial genual setae *l″* 27; tibia 4, paraxial tibial setae *l′* absent; tarsus 4, antaxial fastigial tarsal setae *ft″* 16, paraxial fastigial tarsal setae *ft′* 14, paraxial unguinal tarsal setae *u′* 4, solenidion ω slightly curved, knobbed, 4 long; empodium simple, 4 long, 6-rayed. Leg II 22 long; femur 9 long, ventral basifemoral seta *bv* 15 long; genu 3 long, antaxial genual seta *l″* 7 long; tibia 3 long; tarsus 4 long, antaxial fastigial tarsal seta *ft″* 15 long, paraxial fastigial seta *ft′* 5 long, paraxial unguinal seta *u′* 4 long, solenidion ω slightly curved, knobbed, 7; empodium simple 4, 6-rayed. Coxisternal plates: coxisterna I with a few granules; coxisterna II with smooth surface. Internal coxisternal apodeme a line, 5. Anterior setae on coxisterna I *1b* absent; proximal setae on coxisterna I *1a* 8, 10 apart; proximal setae on coxisterna II *2a* 23, 22 apart; coxigenital semiannuli 3, smooth. Opisthosoma: with 34 dorsal annuli, 58 ventral annuli. Opisthosomal setae *c2* 33, 38 apart, on annulus 8; opisthosomal setae *d* 40, 28 apart, on annulus 19; opisthosomal setae *e* 45, 22 apart, on annulus 34; opisthosomal setae *f* 12, 15 apart, on annulus 53, or 5th annulus from the rear. Opisthosomal setae *h2* 54; opisthosomal setae *h1* 3. Genitalia: 13 wide, proximal setae on coxisterna III *3a* 8, 11 apart.

Type material

Type locality – Bangkruai District, Nonthaburi Province, Thailand.

Neotype – Female (slide set #80) Bangkruai District, Nonthaburi Province (13° 48.79164' N, 100° 25.02810' E), 3 February 1992, leaves of *Litchi chinensis* Sonn. (Lin chi, Litchi, Lychee, Leechee, Li Zhi), Sapindaceae; coll. A. Chandrapatya.

Paratypes – 19 females and one male on 20 microscope slides (slide set #80/1-80/20), with the same collecting information as neotype.

Specimens examined. Mueang Prachin Buri District, Prachin Buri Province (14° 3.03333'N, 101° 22.00000'E), 28 January 1998; 63 females and one male on 64 microscope slides (slide set #648/1-648/64), leaves of *L. chinensis*; coll. A. Chandrapatya; Khet Bangkok Noi, Bangkok, (13° 45.92136' N, 100° 28.33278' E) 31 March 1998; 33 females and one male on 34 microscope slides (slides set #738/1-738/34), leaves of *L. chinensis*; coll. A. Chandrapatya.

Relation to host – Vagrant on the lower leaf surface. No apparent damage was observed.

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دو جنس جدید و یک جابجایی از کنه‌های اریوفیوئید (Acari: Eriophyoidea) از تایلند

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چکیده

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واژگان کلیدی: Eriophyidae ؛ Diptilomiopidae ؛ **جنس جدید** *Phutsona* ؛ **جنس جدید** *Lipacarus* ؛ *Pentacecidophyes* ؛ آلفا-تاکسونومی.

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